

(iii) *Technical analysis.* Discuss the interactions of the potential improvements with existing energy systems.

(A) Estimate the annual energy and energy costs savings expected from each improvement identified in the potential project.

(B) Calculate all direct and attendant indirect costs of each improvement.

(C) Rank potential improvement measures by cost-effectiveness.

(iv) *Potential improvement description.* Provide a narrative summary of the potential improvement and its ability to provide needed benefits, including a discussion of non-energy benefits such as project reliability and durability.

(A) Provide preliminary specifications for critical components.

(B) Provide preliminary drawings of project layout, including any related structural changes.

(C) Document baseline data compared to projected consumption, together with any explanatory notes. Provide the actual total quantity of energy used (BTU) in the original building and/or equipment in the 12 months prior to the EEI project and the projected energy usage after the EEI project shall be the projected total quantity of energy used (BTU) on an annual basis for the same size or capacity as the original building or equipment. For energy efficiency improvement to equipment, if the new piece of equipment has a different capacity than the piece of equipment being replaced, the projected total quantity of energy used for the new piece of equipment shall be adjusted based on the ratio of the capacity of the replaced piece of equipment to the capacity of the new piece of equipment in accordance with the regulation. When appropriate, show before-and-after data in terms of consumption per unit of production, time or area. Include at least 1 year's bills for those energy sources/fuel types affected by this project. Also submit utility rate schedules, if appropriate.

(D) Identify significant changes in future related operations and maintenance costs.

(E) Describe explicitly how outcomes will be measured.

(d) *Design and engineering.* The applicant must submit a statement certifying that their project will be designed and engineered so as to meet the intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards.

(1) Identify possible suppliers and models of major pieces of equipment.

(2) Describe the components, materials, or systems to be installed. Include the location of the project.

(e) *Project development schedule.* Provide a project schedule in an appropriate level of detail that will demonstrate the project can be adequately managed. The applicant must submit a statement certifying that the

project will be completed within 2 years from the date of approval.

(f) *Project economic assessment.* For projects with total eligible project costs greater than \$50,000, provide an analysis of the proposed project to demonstrate its financial performance, including the calculation of simple payback. The analysis should include applicable investment incentives, productivity incentives, loans and grants, and expected energy offsets or sales on a monthly and annual basis. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* The project must be installed in accordance with applicable local, State, and national building and electrical codes and regulations. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules. Upon successful system installation and following established operation, the successful applicant must deliver invoices and evidence of payment.

(i) *Operations and maintenance.* Identify any unique operations and maintenance requirements of the project necessary for the improvement(s) to perform as designed over the design life. State the design life of the improvement(s). Provide information regarding component warranties.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and proper disposal of the project components and associated wastes at the end of their useful lives.

APPENDIX B TO SUBPART B OF PART 4280—TECHNICAL REPORTS FOR PROJECTS WITH TOTAL ELIGIBLE PROJECT COSTS OF GREATER THAN \$200,000

The Technical Report for projects with total eligible project costs greater than \$200,000 (and for any other project that must submit a Technical Report under this appendix) must demonstrate that the project design, procurement, installation, startup, operation, and maintenance of the renewable energy system or energy efficiency improvement will operate or perform as specified over its design life in a reliable and a cost-effective manner. The Technical Report must also identify all necessary project agreements, demonstrate that those agreements will be in place, and that necessary project equipment and services are available over the design life.

All technical information provided must follow the format specified in Sections 1 through 10 of this appendix. Supporting information may be submitted in other formats. Design drawings and process flowcharts are encouraged as exhibits. A discussion of each topic is not necessary if the topic is not applicable to the specific project. Questions identified in the Agency's technical review of the project must be answered to the Agency's satisfaction before the application will be approved. The applicant must submit the original technical report plus one copy to the Rural Development State Office. Renewable energy projects with total eligible project costs greater than \$400,000 and for energy efficiency improvement projects with total eligible project costs greater than \$200,000 require the services of a licensed professional engineer (PE) or team of PEs. Depending on the level of engineering required for the specific project or if necessary to ensure public safety, the services of a licensed PE or a team of licensed PEs may be required for smaller projects.

SECTION 1. BIOENERGY

The technical requirements specified in this section apply to bioenergy projects, which are, as defined in §4280.103, renewable energy systems that produces fuel, thermal energy, or electric power from a renewable biomass source only, other than an anaerobic digester project.

(a) *Qualifications of project team.* The bioenergy project team will vary according to the complexity and scale of the project. For engineered systems, the project team should consist of a system designer, a project manager, an equipment supplier, a project engineer, a construction contractor or system installer, and a system operator and maintainer. One individual or entity may serve more than one role. The project team must have demonstrated expertise in similar bioenergy systems development, engineering, installation, and maintenance. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the serv-

ices of a developer who will design and build the project at the developer's risk;

(2) Discuss the bioenergy system equipment manufacturers of major components being considered in terms of the length of time in business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, system designer, project engineer, and construction contractor qualifications for engineering, designing, and installing bioenergy systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available; and

(4) Describe the system operator's qualifications and experience for servicing, operating, and maintaining bioenergy renewable energy equipment or projects. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (8).

(1) Identify zoning and code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify licenses where required and the schedule for obtaining those licenses.

(3) Identify land use agreements required for the project and the anticipated schedule for securing the agreements and the term of those agreements.

(4) Identify any permits or agreements required for solid, liquid, and gaseous emissions or effluents and the schedule for securing those permits and agreements.

(5) Identify available component warranties for the specific project location and size.

(6) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements. This is required even if the system is installed on the customer side of the utility meter. For systems planning to utilize a local net metering program as their interconnection agreement, describe the applicable local net metering program.

(7) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(8) Submit a statement certifying that the project will be installed in accordance with

applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the type, quantity, quality, and seasonality of the biomass resource, including harvest and storage, where applicable. Where applicable, also indicate shipping or receiving method and required infrastructure for shipping. For proposed projects with an established resource, provide a summary of the resource.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Projects shall be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components. The engineering must be comprehensive, including site selection, system and component selections, and system monitoring equipment. Systems must be constructed by a qualified party.

(1) Provide a concise but complete description of the bioenergy project, including location of the project, resource characteristics, system specifications, electric power system interconnection, and monitoring equipment. Identify possible vendors and models of major system components. Describe the expected electric power, fuel production, or thermal energy production of the proposed system as rated and as expected in actual field conditions. For systems with a capacity of more than 20 tons per day of biomass, address performance on a monthly and annual basis. For small projects such as a commercial biomass furnace or pelletizer of up to 5 tons daily capacity, proven, commercially available devices need not be addressed in detail. Describe the uses of or the market for electricity, heat, or fuel produced by the system. Discuss the impact of reduced or interrupted biomass availability on the system process.

(2) Describe the project site and address issues such as site access, foundations, backup equipment when applicable, and environmental concerns with emphasis on land use, air quality, water quality, soil degradation, habitat fragmentation, land use, visibility, odor, noise, construction, and installation issues. Identify any unique construction and installation issues.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including resource assessment, system and site design, permits and agreements, equipment procure-

ment, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including project management, resource assessment, project design, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed analysis and description of annual project revenues and expenses. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Bioenergy systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Fully describe the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. In addition:

(1) Provide information regarding available system and component warranties and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed system, including maintenance schedule for

the mechanical, piping, and electrical systems and system monitoring and control requirements. Provide information that supports expected design life of the system and timing of major component replacement or rebuilds. Discuss the costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing. Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator; and

(3) For systems having a biomass input capacity exceeding 10 tons of biomass per day, provide and discuss the risk management plan for handling large, potential failures of major components.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 2. ANAEROBIC DIGESTER PROJECTS

The technical requirements specified in this section apply to anaerobic digester projects, which are, as defined in §4280.103, renewable energy systems that use animal or other waste and may include other organic substrates to produce biofuel, biogas, thermal, or electrical energy via anaerobic digestion.

(a) *Qualifications of project team.* The anaerobic digester project team should consist of a system designer, a project manager, an equipment supplier, a project engineer, a construction contractor, and a system operator or maintainer. One individual or entity may serve more than one role. The project team must have demonstrated commercial-scale expertise in anaerobic digester systems development, engineering, installation, and maintenance as related to the organic materials and operating mode of the system. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developer's risk;

(2) Discuss the anaerobic digester system equipment manufacturers of major components being considered in terms of the length of time in business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, system designer, project engineer, and construction contractor qualifications for engineering, designing, and installing anaerobic digester systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating consistent with the substrate material with references, if available; and

(4) For regional or centralized digester plants, describe the system operator's qualifications and experience for servicing, operating, and maintaining similar projects. Farm scale systems may not require operator experience as the developer is typically required to provide operational training during system startup and shakedown. Provide a list of the same or similar projects designed, installed, or supplied and currently operating consistent with the substrate material with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (8).

(1) Identify zoning and code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify licenses where required and the schedule for obtaining those licenses.

(3) For regional or centralized digester plants, identify feedstock access agreements required for the project and the anticipated schedule for securing those agreements and the term of those agreements.

(4) Identify any permits or agreements required for transport and ultimate waste disposal and the schedule for securing those agreements and permits.

(5) Identify available component warranties for the specific project location and size.

(6) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements. This is required even if the system is installed on the customer side of the utility meter. For systems planning to utilize a local net metering program as their interconnection agreement, describe the applicable local net metering program.

(7) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-

20, “Request for Environmental Information,” and in compliance with 7 CFR part 1940, subpart G of this title.

(8) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the substrates used as digester inputs, including animal wastes, food processing wastes, or other organic wastes in terms of type, quantity, seasonality, and frequency of collection. Describe any special handling of feedstock that may be necessary. Describe the process for determining the feedstock resource. Provide either tabular values or laboratory analysis of representative samples that include biodegradability studies to produce gas production estimates for the project on daily, monthly, and seasonal basis.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Projects shall be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components. The engineering must be comprehensive, including site selection, digester component selection, gas handling component selection, and gas use component selection. Systems must be constructed by a qualified party.

(1) Provide a concise but complete description of the anaerobic digester project, including location of the project, farm description, feedstock characteristics, a step-by-step flowchart of unit operations, electric power system interconnection equipment, and any required monitoring equipment. Identify possible vendors and models of major system components. Provide the expected system energy production, heat balances, and material balances as part of the unit operations flowchart.

(2) Describe the project site and address issues such as site access, foundations, backup equipment when applicable, and environmental concerns with emphasis on land use, air quality, water quality, soil degradation, habitat degradation, land use, visibility, odor, noise, construction, and installation issues. Identify any unique construction and installation issues.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including feedstock assessment, system and site designs, permits and agreements, equipment

procurement, system installation from excavation through startup and shakedown, and operator training.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including project management, feedstock assessment, project design, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing, professional services, training and operations, and maintenance costs of both the digester and the gas use systems. Provide a detailed analysis and description of annual project revenues and expenses. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Anaerobic digester systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that “open and free” competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 3-year warranty for equipment and a 10-

year warranty on design. Provide information regarding system warranties and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed project, including maintenance for the digester, the gas handling equipment, and the gas use systems. Describe any maintenance requirements for system monitoring and control equipment;

(3) Provide information that supports the expected design life of the system and the timing of major component replacement or rebuilds;

(4) Provide and discuss the risk management plan for handling large, potential failures of major components. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing; and

(5) Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 3. GEOTHERMAL, ELECTRIC GENERATION

The technical requirements specified in this section apply to electric generation geothermal projects, which are, as defined in §4280.103, systems that use geothermal energy to produce high pressure steam for electric power production.

(a) *Qualifications of project team.* The electric generating geothermal plant project team should consist of a system designer, a project manager, an equipment supplier, a project engineer, a construction contractor, and a system operator and maintainer. One individual or entity may serve more than one role. The project team must have demonstrated expertise in geothermal electric generation systems development, engineering, installation, and maintenance. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the

project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developer's risk;

(2) Discuss the geothermal plant equipment manufacturers of major components being considered in terms of the length of time in business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, system designer, project engineer, and construction contractor qualifications for engineering, designing, and installing geothermal electric generation systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available; and

(4) Describe the system operator's qualifications and experience for servicing, operating, and maintaining electric generating geothermal projects. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (7).

(1) Identify zoning and code issues and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify any permits or agreements required for well construction and for disposal or re-injection of cooled geothermal waters and the schedule for securing those agreements and permits.

(3) Identify land use or access to the resource agreements required for the project and the anticipated schedule for securing the agreements and the term of those agreements.

(4) Identify available component warranties for the specific project location and size.

(5) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements.

(6) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(7) Submit a statement certifying that the project will be installed in accordance with

applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the quality of the geothermal resource, including temperature, flow, and sustainability and what conversion system is to be installed. Describe any special handling of cooled geothermal waters that may be necessary. Describe the process for determining the geothermal resource, including measurement setup for the collection of the geothermal resource data. For proposed projects with an established resource, provide a summary of the resource and the specifications of the measurement setup.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Projects shall be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components. The engineering must be comprehensive, including site selection, system and component selection, conversion system component and selection, design of the local collection grid, interconnection equipment selection, and system monitoring equipment. Systems must be constructed by a qualified party.

(1) Provide a concise but complete description of the geothermal project, including location of the project, resource characteristics, thermal system specifications, electric power system interconnection equipment and project monitoring equipment. Identify possible vendors and models of major system components. Provide the expected system energy production on a monthly and annual basis.

(2) Describe the project site and address issues such as site access, proximity to the electrical grid, environmental concerns with emphasis on land use, air quality, water quality, habitat fragmentation, visibility, noise, construction, and installation issues. Identify any unique construction and installation issues.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including resource assessment, system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Pro-

vide a detailed analysis and description of project costs, including project management, resource assessment, project design, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed analysis and description of annual project revenues, including electricity sales, production tax credits, revenues from green tags, and any other production incentive programs throughout the life of the project. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Geothermal systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup or shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 3-year warranty for equipment. Provide information regarding turbine warranties and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed project, including maintenance for the mechanical and electrical systems and system monitoring and control requirements;

(3) Provide information that supports expected design life of the system and timing of major component replacement or rebuilds;

(4) Provide and discuss the risk management plan for handling large, potential failures of major components such as the turbine. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing; and

(5) Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 4. GEOTHERMAL, DIRECT USE

The technical requirements specified in this section apply to direct use geothermal projects, which are, as defined in §4280.103, systems that use thermal energy directly from a geothermal source.

(a) *Qualifications of project team.* The geothermal project team should consist of a system designer, a project manager, an equipment supplier, a project engineer, a construction contractor, and a system operator and maintainer. One individual or entity may serve more than one role. The project team must have demonstrated expertise in geothermal heating systems development, engineering, installation, and maintenance. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developer's risk;

(2) Discuss the geothermal system equipment manufacturers of major components being considered in terms of the length of time in business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, system designer, project engineer,

and construction contractor qualifications for engineering, designing, and installing direct use geothermal systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available; and

(4) Describe system operator's qualifications and experience for servicing, operating, and maintaining direct use generating geothermal projects. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (7).

(1) Identify zoning and code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify licenses where required and the schedule for obtaining those licenses.

(3) Identify land use or access to the resource agreements required for the project and the anticipated schedule for securing the agreements and the term of those agreements.

(4) Identify any permits or agreements required for well construction and for disposal or re-injection of cooled geothermal waters and the anticipated schedule for securing those permits and agreements.

(5) Identify available component warranties for the specific project location and size.

(6) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(7) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the quality of the geothermal resource, including temperature, flow, and sustainability and what direct use system is to be installed. Describe any special handling of cooled geothermal waters that may be necessary. Describe the process for determining the geothermal resource, including measurement setup for the collection of the geothermal resource data. For proposed projects with an established resource, provide a summary of the resource and the specifications of the measurement setup.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Projects shall be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components. The engineering must be comprehensive, including site selection, system and component selection, thermal system component selection, and system monitoring equipment. Systems must be constructed by a qualified party.

(1) Provide a concise but complete description of the geothermal project, including location of the project, resource characteristics, thermal system specifications, and monitoring equipment. Identify possible vendors and models of major system components. Provide the expected system energy production on a monthly and annual basis.

(2) Describe the project site and address issues such as site access, thermal backup equipment, environmental concerns with emphasis on land use, air quality, water quality, habitat fragmentation, visibility, noise, construction, and installation issues. Identify any unique construction and installation issues.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including resource assessment, system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including project management, resource assessment, project design, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed analysis and description of annual project revenues and expenses. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Geothermal systems may be constructed of components manufactured in

more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 3-year warranty for equipment. Provide information regarding system warranties and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed project, including maintenance for the mechanical and electrical systems and system monitoring and control requirements;

(3) Provide information that supports expected design life of the system and timing of major component replacement or rebuilds;

(4) Provide and discuss the risk management plan for handling large, potential failures of major components. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing; and

(5) Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 5. HYDROGEN PROJECTS

The technical requirements specified in this section apply to hydrogen projects, which are, as defined in §4280.103, renewable energy systems that produce hydrogen or, a renewable energy system that uses mechanical or electric power or thermal energy from a renewable resource using hydrogen as an energy transport medium.

(a) *Qualifications of project team.* The hydrogen project team will vary according to the complexity and scale of the project. For engineered systems, the project team should consist of a system designer, a project manager, an equipment supplier, a project engineer, a construction contractor or system installer, and a system operator and maintainer. One individual or entity may serve more than one role. The project team must have demonstrated expertise in similar hydrogen systems development, engineering, installation, and maintenance. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developer's risk;

(2) Discuss the hydrogen system equipment manufacturers of major components for the hydrogen system being considered in terms of the length of time in the business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, system designer, project engineer, and construction contractor qualifications for engineering, designing, and installing hydrogen systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available; and

(4) Describe the system operator's qualifications and experience for servicing, operating, and maintaining hydrogen system equipment or projects. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and per-

mits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (8).

(1) Identify zoning and building code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify licenses where required and the schedule for obtaining those licenses.

(3) Identify land use agreements required for the project and the anticipated schedule for securing the agreements and the term of those agreements.

(4) Identify any permits or agreements required for solid, liquid, and gaseous emissions or effluents and the anticipated schedule for securing those permits and agreements.

(5) Identify available component warranties for the specific project location and size.

(6) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements. This is required even if the system is installed on the customer side of the utility meter. For systems planning to utilize a local net metering program as their interconnection agreement, describe the applicable local net metering program.

(7) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(8) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the type, quantity, quality, and seasonality of the biomass resource. For solar, wind, or geothermal sources of energy used to generate hydrogen, indicate the local renewable resource where the hydrogen system is to be installed. Local resource maps may be used as an acceptable preliminary source of renewable resource data. For proposed projects with an established renewable resource, provide a summary of the resource.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Projects shall be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components. The engineering must be comprehensive, including site selection, system

and component selection, and system monitoring equipment. Systems must be constructed by a qualified party.

(1) Provide a concise but complete description of the hydrogen project, including location of the project, resource characteristics, system specifications, electric power system interconnection equipment, and monitoring equipment. Identify possible vendors and models of major system components. Describe the expected electric power, fuel production, or thermal energy production of the proposed system. Address performance on a monthly and annual basis. Describe the uses of or the market for electricity, heat, or fuel produced by the system. Discuss the impact of reduced or interrupted resource availability on the system process.

(2) Describe the project site and address issues such as site access, foundations, backup equipment when applicable, and any environmental and safety concerns with emphasis on land use, air quality, water quality, and safety hazards. Identify any unique construction and installation issues.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including resource assessment, system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including project management, resource assessment, project design and engineering, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed analysis and description of annual project revenues and expenses. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Hydrogen systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues, such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, and receiving, and on-site storage or inventory. Identify all the

major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Provide information regarding system warranties and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed project, including maintenance of the reformer, electrolyzer, or fuel cell as appropriate, and other mechanical, piping, and electrical systems and system monitoring and control requirements;

(3) Provide information that supports expected design life of the system and timing of major component replacement or rebuilds;

(4) Provide and discuss the risk management plan for handling large, potential failures of major components. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing; and

(5) Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 6. SOLAR, SMALL

The technical requirements specified in this section apply to small solar electric projects and small solar thermal projects, as defined in § 4280.103.

Small solar electric projects are those for which the rated power of the system is 10kW or smaller. Small solar electric projects are

either stand-alone (off grid) or inter-connected to the grid at less than 600 volts (on grid).

Small solar thermal projects are those for which the rated storage volume of the system is 240 gallons or smaller, or which have a collector area of 1,000 square feet or less.

(a) *Qualifications of project team.* The small solar project team should consist of a system designer, a project manager or general contractor, an equipment supplier of major components, a system installer, a system maintainer, and, in some cases, the owner of the application or load served by the system. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

- (1) Discuss the qualifications of the suppliers of major components being considered;
- (2) Describe the knowledge, skills, and abilities needed to service, operate, and maintain the system for the proposed application; and

- (3) Discuss the project manager, system designer, and system installer qualifications for engineering, designing, and installing small solar systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar systems designed or installed by the design and installation team and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (5).

- (1) Identify zoning, building, and electrical code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

- (2) Identify available component warranties for the specific project location and size.

- (3) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements. This is required even if the system is installed on the customer side of the utility meter. For systems planning to utilize a local net metering program as their interconnection agreement, describe the applicable local net metering program.

- (4) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Informa-

tion," and in compliance with 7 CFR part 1940, subpart G of this title.

(5) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the source of the solar data and assumptions.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. For small solar electric systems, the engineering must be comprehensive, including solar collector design and selection, support structure design and selection, power conditioning design and selection, surface or submersible water pumps and energy storage requirements as applicable, and selection of cabling, disconnects and interconnection equipment. For small solar thermal systems, the engineering must be comprehensive, including solar collector design and selection, support structure design and selection, pump and piping design and selection, and energy storage design and selection.

- (1) Provide a concise but complete description of the small solar system, including location of the project and proposed equipment specifications. Identify possible vendors and models of major system components. Provide the expected system energy production based on available solar resource data on a monthly (when possible) and annual basis and how the energy produced by the system will be used.

- (2) Describe the project site and address issues such as solar access, orientation, proximity to the load or the electrical grid, environmental concerns such as water quality and land use, unique safety concerns such as hazardous materials handling, construction, and installation issues, and whether special circumstances exist.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through start-up and shakedown. Provide a detailed description of the project timeline, including system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including design, permitting,

equipment, site preparation, system installation, system startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. Provide a detailed description of historic or expected energy use and expected energy offsets or sales on a monthly and annual basis. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Small solar systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 5-year warranty for equipment. Provide information regarding system warranty and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed system, including maintenance schedules for the mechanical and electrical and software systems;

(3) For owner maintained portions of the system, describe any unique knowledge, skills, or abilities needed for service operations or maintenance; and

(4) Provide information regarding expected system design life and timing of major component replacement or rebuilds. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes. Describe any environmental compliance requirements such as proper disposal or recycling procedures to reduce potential impact from any hazardous chemicals.

SECTION 7. SOLAR, LARGE

The technical requirements specified in this section apply to large solar electric projects and large solar thermal projects, as defined in § 4280.103.

Large solar electric systems are those for which the rated power of the system is larger than 10kW. Large solar electric systems are either stand-alone (off grid) or interconnected to the grid (on grid).

Large solar thermal systems are those for which the rated storage volume of the system is greater than 240 gallons or that have a collector area of more than 1,000 square feet.

(a) *Qualifications of project team.* The large solar project team should consist of an equipment supplier of major components, a project manager, general contractor, system engineer, system installer, and system maintainer. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developer's risk;

(2) Discuss the qualifications of the suppliers of major components being considered;

(3) Discuss the project manager, general contractor, system engineer, and system installer qualifications for engineering, designing, and installing large solar systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar systems designed or installed by the design, engineering, and installation team and currently operating with references, if available; and

(4) Describe the system operator's qualifications and experience for servicing, operating, and maintaining the system for the proposed application. Provide a list of the same or similar systems designed or installed by the design, engineering, and installation team and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (5).

(1) Identify zoning, building, and electrical code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify available component warranties for the specific project location and size.

(3) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements. This is required even if the system is installed on the customer side of the utility meter. For systems planning to utilize a local net metering program as their interconnection agreement, describe the applicable local net metering program.

(4) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(5) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the source of the solar data and assumptions.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards.

(1) For large solar electric systems, the engineering must be comprehensive, including solar collector design and selection, support

structure design and selection, power conditioning design and selection, surface or submersible water pumps and energy storage requirements as applicable, and selection of cabling, disconnects, and interconnection equipment. A complete set of engineering drawings, stamped by a professional engineer, must be provided.

(2) For large solar thermal systems, the engineering must be comprehensive, including solar collector design and selection, support structure design and selection, pump and piping design and selection, and energy storage design and selection. Provide a complete set of engineering drawings stamped by a professional engineer.

(3) For either type of system, provide a concise but complete description of the large solar system, including location of the project and proposed equipment and system specifications. Identify possible vendors and models of major system components. Provide the expected system energy production based on available solar resource data on a monthly (when possible) and annual basis and how the energy produced by the system will be used.

(4) For either type of system, provide a description of the project site and address issues such as solar access, orientation, proximity to the load or the electrical grid, environmental concerns such as land use, water quality, habitat fragmentation, and aesthetics, unique safety concerns, construction, and installation issues, and whether special circumstances exist.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including *Design and engineering*, permitting, equipment, site preparation, system installation, system startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. Provide a detailed description of historic or expected energy use and expected energy offsets or sales on a monthly and annual basis. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Large solar systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that “open and free” competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment, including cranes and other devices needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 5-year warranty for equipment. Provide information regarding system warranty and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed system, including maintenance schedules for the mechanical, electrical, and software systems;

(3) For owner maintained portions of the system, describe any unique knowledge, skills, or abilities needed for service operations or maintenance; and

(4) Provide information regarding expected system design life and timing of major component replacement or rebuilds. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique con-

cerns associated with the dismantling and disposal of project components and their wastes. Describe any environmental compliance requirements such as proper disposal or recycling procedures to reduce any potential impact from hazardous chemicals.

SECTION 8. WIND, SMALL

The technical requirements specified in this section apply to small wind systems, which are, as defined in §4280.103, wind energy systems for which the rated power of the wind turbine is 100kW or smaller and with a generator hub height of 120 ft or less. Small wind systems are either stand-alone or connected to the local electrical system at less than 600 volts.

(a) *Qualifications of project team.* The small wind project team should consist of a system designer, a project manager or general contractor, an equipment supplier of major components, a system installer, a system maintainer, and, in some cases, the owner of the application or load served by the system. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the small wind turbine manufacturers and other equipment suppliers of major components being considered in terms of their length of time in business and the number of units installed at the capacity and scale being considered;

(2) Describe the knowledge, skills, and abilities needed to service, operate, and maintain the system for the proposed application; and

(3) Discuss the project manager, system designer, and system installer qualifications for engineering, designing, and installing small wind systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar systems designed, installed, or supplied and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (5).

(1) Identify zoning, building, and electrical code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify available component warranties for the specific project location and size.

(3) For systems planning to interconnect with a utility, describe the utility's system

interconnection requirements, power purchase agreements, or licenses, where required, and the anticipated schedule for meeting those requirements and obtaining those agreements. This is required even if the system is installed on the customer side of the utility meter. For systems planning to utilize a local net metering program as their interconnection agreement, describe the applicable local net metering program.

(4) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940-20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(5) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Indicate the source of the wind data and the conditions of the wind monitoring when collected at the site or assumptions made when applying nearby wind data to the site.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Small wind systems must be engineered by either the wind turbine manufacturer or other qualified party. Systems must be offered as a complete, integrated system with matched components. The engineering must be comprehensive, including turbine design and selection, tower design and selection, specification of guy wire anchors and tower foundation, inverter/controller design and selection, energy storage requirements as applicable, and selection of cabling, disconnects, and interconnection equipment, as well as the engineering data needed to match the wind system output to the application load, if applicable.

(1) Provide a concise but complete description of the small wind system, including location of the project, proposed turbine specifications, tower height and type of tower, type of energy storage and location of storage if applicable, proposed inverter manufacturer and model, electric power system interconnection equipment, and application load and load interconnection equipment as applicable. Identify possible vendors and models of major system components. Provide the expected system energy production based on available wind resource data on a monthly (when possible) and annual basis and how the energy produced by the system will be used.

(2) Describe the project site and address issues such as access to the wind resource, proximity to the electrical grid or applica-

tion load, environmental concerns with emphasis on historic properties, visibility, noise, bird and bat populations, and wildlife habitat destruction and/or fragmentation, construction, and installation issues and whether special circumstances such as proximity to airports exist. Provide a 360-degree panoramic photograph of the proposed site, including indication of prevailing winds when possible.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through start-up and shakedown. Provide a detailed description of the project timeline, including system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the project, including the calculation of simple payback. Provide a detailed analysis and description of project costs, including design, permitting, equipment, site preparation, system installation, system startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. Provide a detailed description of historic or expected energy use and expected energy offsets or sales on a monthly and annual basis. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Small wind systems may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment, including cranes and

other devices needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 5-year warranty for equipment and a commitment from the supplier to have spare parts available. Provide information regarding system warranty and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed system, including maintenance schedules for the mechanical, electrical, and software systems;

(3) Provide historical or engineering information that supports expected design life of the system and timing of major component replacement or rebuilds. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing; and

(4) For owner maintained portions of the system, describe any unique knowledge, skills, or abilities needed for service operations or maintenance.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 9. WIND, LARGE

The technical requirements specified in this section apply to wind energy systems, which are, as defined in §4280.103, wind energy projects for which the rated power of the individual wind turbine(s) is larger than 100kW.

(a) *Qualifications of project team.* The large wind project team should consist of a project manager, a meteorologist, an equipment supplier, a project engineer, a primary or general contractor, construction contractor, and a system operator and maintainer and, in some cases, the owner of the application or load served by the system. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Au-

thoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid, build where a separate engineering firm may design the project and prepare a request for bids and the successful bidder constructs the project at the applicant's risk, and a design/build method, often referred to as turnkey, where the applicant establishes the specifications for the project and secures the services of a developer who will design and build the project at the developer's risk;

(2) Discuss the large wind turbine manufacturers and other equipment suppliers of major components being considered in terms of the length of time in business and the number of units installed at the capacity and scale being considered;

(3) Discuss the project manager, equipment supplier, project engineer, and construction contractor qualifications for engineering, designing, and installing large wind systems, including any relevant certifications by recognized organizations. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available;

(4) Discuss the qualifications of the meteorologist, including references; and

(5) Describe system operator's qualifications and experience for servicing, operating, and maintaining the system for the proposed application. Provide a list of the same or similar projects designed, installed, or supplied and currently operating with references, if available.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the project and the status and schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (6).

(1) Identify zoning, building, and electrical code issues, and required permits and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify land use agreements required for the project and the anticipated schedule for securing the agreements and the term of those agreements.

(3) Identify available component warranties for the specific project location and size.

(4) For systems planning to interconnect with a utility, describe the utility's system interconnection requirements, power purchase agreements, or licenses where required and the anticipated schedule for meeting those requirements and obtaining those agreements.

(5) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940–

20, "Request for Environmental Information," and in compliance with 7 CFR part 1940, subpart G of this title.

(6) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Resources assessment.* Provide adequate and appropriate data to demonstrate the amount of renewable resource available. Projects greater than 500kW must obtain wind data from the proposed project site. For such projects, describe the proposed measurement setup for the collection of the wind resource data. For proposed projects with an established wind resource, provide a summary of the wind resource and the specifications of the measurement setup. Large wind systems larger than 500kW in size will typically require at least 1 year of on-site monitoring. If less than 1 year of data is used, the qualified meteorological consultant must provide a detailed analysis of the correlation between the site data and a nearby, long-term measurement site.

(d) *Design and engineering.* Provide authoritative evidence that the system will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards. Large wind systems must be engineered by a qualified party. Systems must be engineered as complete, integrated systems with matched components. The engineering must be comprehensive, including site selection, turbine selection, tower selection, tower foundation, design of the local collection grid, interconnection equipment selection, and system monitoring equipment. For stand-alone, non-grid applications, engineering information must be provided that demonstrates appropriate matching of wind turbine and load.

(1) Provide a concise, but complete, description of the large wind project, including location of the project, proposed turbine specifications, tower height and type of tower, the collection grid, interconnection equipment, and monitoring equipment. Identify possible vendors and models of major system components. Provide the expected system energy production based on available wind resource data on a monthly and annual basis. For wind projects larger than 500kW in size, provide the expected system energy production over the life of the project, including a discussion on inter-annual variation using a comparison of the on-site monitoring data with long-term meteorological data from a nearby monitored site.

(2) Describe the project site and address issues such as site access, proximity to the electrical grid or application load, environmental concerns with emphasis on historic properties, visibility, noise, bird and bat populations, and wildlife habitat destruction

and/or fragmentation, construction, and installation issues and whether special circumstances such as proximity to airports exist.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through startup and shakedown. Provide a detailed description of the project timeline, including resource assessment, system and site design, permits and agreements, equipment procurement, and system installation from excavation through startup and shakedown.

(f) *Project economic assessment.* Provide a study that describes the costs and revenues of the proposed project to demonstrate the financial performance of the proposed project. Provide a detailed analysis and description of project costs, including project management, resource assessment, project design, project permitting, land agreements, equipment, site preparation, system installation, startup and shakedown, warranties, insurance, financing, professional services, and operations and maintenance costs. Provide a detailed description of applicable investment incentives, productivity incentives, loans, and grants. Provide a detailed analysis and description of annual project revenues, including electricity sales, production tax credits, revenues from green tags, and any other production incentive programs throughout the life of the project. Provide a description of planned contingency fees or reserve funds to be used for unexpected large component replacement or repairs and for low productivity periods. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required by the system is available and can be procured and delivered within the proposed project development schedule. Large wind turbines may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that "open and free" competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for site development and system installation, provide details regarding the scheduling of major installation equipment, including cranes or

other devices, needed for project construction, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the system necessary for the system to operate as designed over the design life. The application must:

(1) Ensure that systems must have at least a 3-year warranty for equipment. Provide information regarding turbine warranties and availability of spare parts;

(2) Describe the routine operations and maintenance requirements of the proposed project, including maintenance schedules for the mechanical and electrical systems and system monitoring and control requirements;

(3) Provide information that supports expected design life of the system and timing of major component replacement or rebuilds;

(4) Provide and discuss the risk management plan for handling large, potential failures of major components such as the turbine gearbox or rotor. Include in the discussion, costs and labor associated with the operation and maintenance of the system, and plans for in-sourcing or out-sourcing;

(5) Describe opportunities for technology transfer for long-term project operations and maintenance by a local entity or owner/operator; and

(6) For owner maintained portions of the system, describe any unique knowledge, skills, or abilities needed for service operations or maintenance.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and disposal of project components and their wastes.

SECTION 10. ENERGY EFFICIENCY IMPROVEMENTS

The technical requirements specified in this section apply to projects that involve energy efficiency improvements, which are, as defined in § 4280.103, improvements to a facility, building, or process that reduce energy consumption, or reduce energy consumed per square foot. The system engineering for such projects must be performed by a qualified party or certified Professional Engineer.

(a) *Qualifications of project team.* The energy efficiency project team is expected to consist of an energy auditor or other service pro-

vider, a project manager, an equipment supplier of major components, a project engineer, and a construction contractor or system installer. One individual or entity may serve more than one role. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the qualifications of the various project team members, including any relevant certifications by recognized organizations;

(2) Describe qualifications or experience of the team as related to installation, service, operation and maintenance of the project;

(3) Provide a list of the same or similarly engineered projects designed, installed, or supplied by the team or by team members and currently operating. Provide references if available; and

(4) Discuss the manufacturers of major energy efficiency equipment being considered, including length of time in business.

(b) *Agreements, permits, and certifications.* Identify all necessary agreements and permits required for the energy efficiency improvement(s) and the status and anticipated schedule for securing those agreements and permits, including the items specified in paragraphs (b)(1) through (4). The applicant must also submit a statement certifying that the applicant will comply with all necessary agreements and permits for the energy efficiency improvement(s).

(1) Identify building code, electrical code, and zoning issues and required permits, and the anticipated schedule for meeting those requirements and securing those permits.

(2) Identify available component warranties for the specific project location and size.

(3) Identify all environmental issues, including environmental compliance issues, associated with the project on Form RD 1940–20, “Request for Environmental Information,” and in compliance with 7 CFR part 1940, subpart G of this title.

(4) Submit a statement certifying that the project will be installed in accordance with applicable local, State, and national codes and regulations.

(c) *Energy audits.* For all energy efficiency improvement projects, provide adequate and appropriate evidence of energy savings expected when the system is operated as designed.

(1) An energy audit is a written report by an independent, qualified party that documents current energy usage, recommended potential improvements and their costs, energy savings from these improvements, dollars saved per year, and simple payback. The

methodology of the energy audit must meet professional and industry standards.

(2) The energy audit must cover the following:

(i) *Situation report.* Provide a narrative description of the facility or process, its energy system(s) and usage, and activity profile. Also include price per unit of energy (electricity, natural gas, propane, fuel oil, renewable energy, etc.) paid by the customer on the date of the audit. Any energy conversion should be based on use rather than source.

(ii) *Potential improvements.* List specific information on all potential energy-saving opportunities and the associated costs.

(iii) *Technical analysis.* Discuss the interactions of the potential improvements with existing energy systems.

(A) Estimate the annual energy and energy costs savings expected from each improvement identified in the potential project.

(B) Calculate all direct and attendant indirect costs of each improvement.

(C) Rank potential improvement measures by cost-effectiveness.

(iv) *Potential improvement description.* Provide a narrative summary of the potential improvement and its ability to provide needed benefits, including a discussion of non-energy benefits such as project reliability and durability.

(A) Provide preliminary specifications for critical components.

(B) Provide preliminary drawings of project layout, including any related structural changes.

(C) Document baseline data compared to projected consumption, together with any explanatory notes. Provide the actual total quantity of energy used (BTU) in the original building and/or equipment in the 12 months prior to the EEI project and the projected energy usage after the EEI project shall be the projected total quantity of energy used (BTU) on an annual basis for the same size or capacity as the original building or equipment. For energy efficiency improvement to equipment, if the new piece of equipment has a different capacity than the piece of equipment being replaced, the projected total quantity of energy used for the new piece of equipment shall be adjusted based on the ratio of the capacity of the replaced piece of equipment to the capacity of the new piece of equipment in accordance with the regulation. When appropriate, show before-and-after data in terms of consumption per unit of production, time or area. Include at least 1 year's bills for those energy sources/fuel types affected by this project. Also submit utility rate schedules, if appropriate.

(D) Identify significant changes in future related operations and maintenance costs.

(E) Describe explicitly how outcomes will be measured.

(d) *Design and engineering.* Provide authoritative evidence that the energy efficiency improvement(s) will be designed and engineered so as to meet its intended purpose, will ensure public safety, and will comply with applicable laws, regulations, agreements, permits, codes, and standards.

(1) Energy efficiency improvement projects in excess of \$50,000 must be engineered by a qualified party. Systems must be engineered as a complete, integrated system with matched components.

(2) For all energy efficiency improvement projects, identify and itemize major energy efficiency improvements, including associated project costs. Specifically delineate which costs of the project are directly associated with energy efficiency improvements. Describe the components, materials or systems to be installed and how they improve the energy efficiency of the process or facility being modified. Discuss passive improvements that reduce energy loads, such as improving the thermal efficiency of a storage facility, and active improvements that directly reduce energy consumption, such as replacing existing energy consuming equipment with high efficiency equipment, as separate topics. Discuss any anticipated synergy between active and passive improvements or other energy systems. Include in the discussion any change in on-site effluents, pollutants, or other by-products.

(3) Identify possible suppliers and models of major pieces of equipment.

(e) *Project development schedule.* Identify each significant task, its beginning and end, and its relationship to the time needed to initiate and carry the project through start-up and shakedown. Provide a detailed description of the project timeline, including energy audit (if applicable), system and site design, permits and agreements, equipment procurement, and system installation from site preparation through startup and shakedown.

(f) *Project economic assessment.* For projects whose total eligible costs are greater than \$50,000, provide an analysis of the proposed project to demonstrate its financial performance, including the calculation of simple payback. The analysis should include applicable investment incentives, productivity incentives, loans and grants, and expected energy offsets or sales on a monthly and annual basis. In addition, provide other information necessary to assess the project's cost effectiveness.

(g) *Equipment procurement.* Demonstrate that equipment required for the energy efficiency improvement(s) is available and can be procured and delivered within the proposed project development schedule. Energy efficiency improvements may be constructed of components manufactured in more than one location. Provide a description of any unique equipment procurement issues such

as scheduling and timing of component manufacture and delivery, ordering, warranties, shipping, receiving, and on-site storage or inventory. Provide a detailed description of equipment certification. Identify all the major equipment that is proprietary and justify how this unique equipment is needed to meet the requirements of the proposed design. Include a statement from the applicant certifying that “open and free” competition will be used for the procurement of project components in a manner consistent with the requirements of 7 CFR part 3015 of this title.

(h) *Equipment installation.* Describe fully the management of and plan for installation of the energy efficiency improvement(s), identify specific issues associated with installation, provide details regarding the scheduling of major installation equipment needed for project discussion, and provide a description of the startup and shakedown specifications and process and the conditions required for startup and shakedown for each equipment item individually and for the system as a whole. Include in this discussion any unique concerns, such as the effects of energy efficiency improvements on system power quality. Include a statement from the applicant certifying that equipment installation will be made in accordance with all applicable safety and work rules.

(i) *Operations and maintenance.* Identify the operations and maintenance requirements of the energy efficiency improvement(s) necessary for the energy efficiency improvement(s) to perform as designed over the design life. The application must:

(1) Provide information regarding component warranties and the availability of spare parts;

(2) Describe the routine operation and maintenance requirements of the proposed project, including maintenance schedules for the mechanical and electrical systems and system monitoring and control requirements;

(3) Provide information that supports expected design life of the improvement(s) and timing of major component replacement or rebuilds;

(4) Provide and discuss the risk management plan for handling large, potential failures of major components. Include in the discussion, costs and labor associated with the operation and maintenance of the improvement(s), and plans for in-sourcing or out-sourcing; and

(5) For owner maintained portions of the improvement(s), describe any unique knowledge, skills, or abilities needed for service operations or maintenance.

(j) *Dismantling and disposal of project components.* Describe a plan for dismantling and disposing of project components and associated wastes at the end of their useful lives. Describe the budget for and any unique concerns associated with the dismantling and

disposal of project components and their wastes.

APPENDIX C TO SUBPART B OF PART 4280—TECHNICAL REPORT FOR HYDROPOWER PROJECTS

The technical requirements specified in this appendix apply to all hydropower projects. Hydropower projects are those projects that create hydroelectric or ocean energy.

The Technical Report for hydropower projects must demonstrate that the project design, procurement, installation, startup, operation, and maintenance of the renewable energy system will operate or perform as specified over its design life in a reliable and a cost-effective manner. The Technical Report must also identify all necessary project agreements, demonstrate that those agreements will be in place, and that necessary project equipment and services are available over the design life.

All technical information provided must follow the format specified in this appendix. Supporting information may be submitted in other formats. Design drawings and process flowcharts are encouraged as exhibits. A discussion of each topic is not necessary if the topic is not applicable to the specific project. Questions identified in the Agency’s technical review of the project must be answered to the Agency’s satisfaction before the application will be approved. The applicant must submit the original Technical Report plus one copy to the Rural Development State Office. Hydropower projects with total eligible project costs greater than \$400,000 require the services of a licensed professional engineer (PE) or team of PEs. Depending on the level of engineering required for the specific project or if necessary to ensure public safety, the services of a licensed PE or a team of licensed PEs may be required for smaller projects.

(a) *Qualifications of project team.* The hydropower project team should consist of a system designer, a project manager, an equipment supplier, a project engineer, a construction contractor, and a system operator and maintainer. One individual or entity may serve more than one role. The project team must have demonstrated expertise in hydropower development, engineering, installation, and maintenance. Authoritative evidence that project team service providers have the necessary professional credentials or relevant experience to perform the required services must be provided. Authoritative evidence that vendors of proprietary components can provide necessary equipment and spare parts for the system to operate over its design life must also be provided. The application must:

(1) Discuss the proposed project delivery method. Such methods include a design, bid,